REMARKS

Claims 1-26 are pending in the application.

Claims 1-26 have been rejected.

Rejection of Claims Under 35 U.S.C. §103

Claims 1-26 stand rejected under 35 U.S.C. §103(a) as purportedly being unpatentable over U.S. Patent 6,405,284 issued to Bridge et al. ("Bridge) and U.S. Patent 5,819,310 issued to Vishlitzky et al. ("Vishlitzky"). Applicants respectfully traverse this rejection.

In order for a claim to be rendered invalid under 35 U.S.C. §103, the subject matter of the claim as a whole would have to be obvious to a person of ordinary skill in the art at the time the invention was made. *See* 35 U.S.C. §103(a). This requires: (1) the reference(s) must teach or suggest all of the claim limitations; (2) there must be some teaching, suggestion or motivation to combine references either in the references themselves or in the knowledge of the art; and (3) there must be a reasonable expectation of success. *See* MPEP 2143; MPEP 2143.03; *In re Rouffet*, 149 F.3d 1350, 1355-56 (Fed. Cir. 1998).

Independent Claims 1, 13 and 25 each involve responding to a request to perform a set of operations "on a plurality of logical volumes." For example, Claim 1 provides the following limitations performed "in response to a request to perform a set of operations on a plurality of logical volumes":

- identifying a first storage region ... to allocate for a first operation ... <u>on a first logical volume</u> of the plurality of logical volumes; and

- determining whether a second operation ... can be performed <u>on a second logical volume</u> of the plurality of logical volumes using a subset of the plurality of storage regions, wherein the subset excludes the first storage region.

See, e.g., Claim 1 (emphasis added). These limitations of the independent claims require both a first and a second logical volume. Applicants respectfully submit the references do not provide disclosure of operations involving both a first and a second logical volume.

The cited sections of Bridge disclose <u>only</u> operations involving <u>one</u> logical volume. The Office Action cites to a section of Bridge purportedly disclosing allocating a parity extent set for redundancy protection in a logical volume. *See* Bridge 19:24-61. In this cited section, Bridge first discloses finding "a disk drive for the primary extent of the parity extent set and allocat[ing] parity extent on selected disk drive." Bridge 19:40-42. Thus, Bridge finds <u>one</u> disk drive, which is then used to provide the primary extent <u>and</u> the parity extent. Bridge then discloses "allocat[ing] data extents on full mirror partners of the disk drive containing the parity extent.... The selected full mirror partners should have available free space to allocate the data extents. If sufficient fill [sic] mirror partners cannot be found, then deallocate the primary extent and go back to 1102 to select a different disk drive for the primary parity extent." Bridge 19:45-54. Thus, if the disk drive found cannot support <u>both</u> the primary and parity extents, Bridge must find another disk drive in hopes of finding a disk drive capable of supporting <u>both</u> extents. Given the disclosed definitions provided by Bridge for terminology in the cited section (e.g., "mirror partner" and "parity extent"), it is clear that Bridge only discloses data stored in <u>one</u> logical volume, and not first and second logical volumes, as claimed. Because Bridge's disclosure mandates that both extents be supported on a single drive, Bridge is oblivious to the use of two (or more) logical volumes.

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Bridge Fig. 5 illustrates "extent mirroring [that] can be used to maintain two copies of each extent for a logical volume." Bridge 12:20-21. Bridge further describes Figure 5 as showing "logical volume 502 includ[ing] extent sets 504 and 506." Bridge 12:32-33. Bridge further explains the benefit of the illustrated extent mirroring as "more flexible than mirroring entire disk drives since it allows the redundancy to be specified on a per logical volume basis." Bridge 12:47-49. Bridge also mentions that extent mirroring can be performed at granularities smaller than a logical volume, but Applicants submit that Bridge does not provide mirroring of one logical volume onto another logical volume as implied by the Office Action's citation of Bridge 19:24-61 for the proposition of disclosing both the "identifying" and "determining" limitations of the independent claims. *See* Bridge 12:55-56. Bridge further discloses that parity extents are allocated either on a per logical volume level or a sub-logical volume level. *See* Bridge 13:9-22. Applicants respectfully submit that Bridge does not disclose the use of parity extents on a logical volume-to-logical volume level as suggested by the Office Action's cited text.

The Office Action introduces Vishlitzky for the prospect that it "teaches of a mirrored set, mirroring data from one logical volume to another." Office Action, p.3 (citing Vishlitzky 6:25-40). The cited section of Vishlitzky merely provides a general description of mirroring.

> As in any system incorporating conventional mirroring technology, each time the data processor 11 transfers data to a mirrored logical volume, such as logical volume LVA, it actually transfers data to logical volume M1-LVA and M2-LVA in the mirrored physical storage devices 12 and 17, respectively. Thus, during normal operations, the data in the storage devices 12 and 17 typically have identical structures.

Vishlitzky 6:34-40 (emphasis added). Applicants respectfully submit that the cited disclosure of Vishlitzky doesn't cure the defects of Bridge.

As disclosed by Vishlitzky, a mirror volume of Bridge would have identical structure to that disclosed in Bridge. Vishlitzky's mirrored volume would not provide the first and second logical volumes on which to perform distinct operations, as provided in the claims. It would further not allow Bridge to perform extent searches across distinct logical volumes, because the mirror set would merely be a copy of the set of extents in Bridge's disclosed logical volume.

For at least these reasons, the Office Action does not establish the presence of the limitations of independent Claims 1, 13 and 25 in Bridge or Vishlitzky, alone or in combination. The burden is on the Examiner to support a case of obviousness, including whether the prior art references teach or suggest all of the claim limitations. *See* MPEP 706.02(j).

In addition, Applicants also respectfully submit that the Office Action has not satisfied the burden of factually supporting the alleged motivation to combine the two references. The Office Action must provide evidence to suggest the combination and "[b]road conclusory statements regarding the teaching of multiple references, standing alone, are not 'evidence.'" *See In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). Further, the Office action does not establish that such a combination of the teachings of these references would meet with success, as required.

Applicants respectfully submit that Bridge actually teaches away from the use of a full mirror volume as disclosed in Vishlitzky. As stated above, Bridge explains the benefit of the illustrated extent mirroring as "more flexible than mirroring entire disk drives since it allows the redundancy to be specified on a per logical volume basis." Bridge 12:47-49. On the other hand, the cited section of Vishlitzky is only concerned
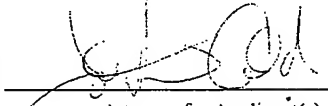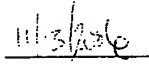
with providing the data redundancy of mirrored volumes and does not using the mirrored volumes to provide extent allocation across the logical volumes.

Applicants further submit that the combination of Vishlitzky with Bridge would not be successful because Vishlitzky merely discloses mirror volume sets, which have "identical structures." Vishlitzky would not permit Bridge to expand beyond finding extents in Bridge's one logical volume, but would instead merely copy Bridge's one logical volume structure to a mirrored logical volume. This is clearly not the claimed functionality.
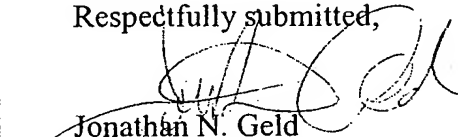
For these reasons, Applicants respectfully submit that the Office Action fails to present a *prima facie* case of obviousness of Claims 1, 13 and 25, and all claims dependent upon them, and that they are in condition for allowance. Applicants therefore request the Examiner's reconsideration of the rejections to those claims.

CONCLUSION

In view of the amendments and remarks set forth herein, the application and the claims therein are believed to be in condition for allowance without any further examination and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5090.

Respectfully submitted,

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